Real-time Nitrate Concentrations and Loads in the lower Atchafalaya River

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Relation to Gulf of Mexico Program (GMP) & Louisiana Goals & Objectives

- Supports GMP Action Plan for Reducing, Controlling, & Mitigating Hypoxia in the Northern Gulf of Mexico
- Assists in State of Louisiana coastal restoration plans to divert Miss. R. water to enhance marsh health & reduce nitrate loading
- Expertise can be transferred to other coastal basins with eutrophication issues

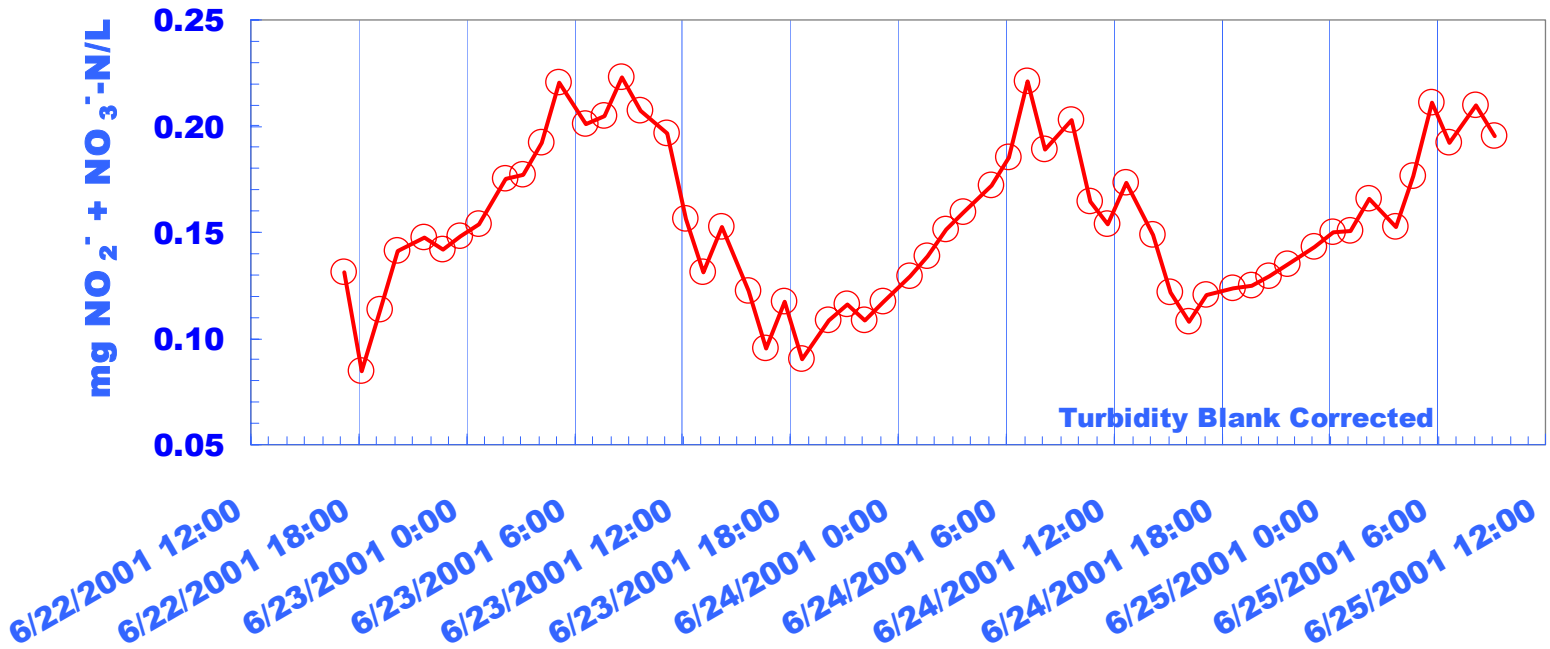
Nitrate Analyzer History

- Early 1999: Tested a German (STIP) unit with ion-selective probe; by 2000 it was proven unacceptable
- 2000-2001: Investigated other units (Chelsea, Envirotech)
- Early 2001: Envirotech NAS purchased by USGS La. District, modified by NWQL in 2001 to work better in FW.
- May 2002: Proposal to GMP for deployment accepted
- November 2002: Installed on the Atchafalaya
- January 2003: Good data transmission

Envirotech Nitrate Analysis System (NAS)

- Pros
  - Uses cadmium reduction colorimetry, not ion-selective probe
  - Operates on solar-powered batteries
  - Real-time transmission to office
- Cons
  - Steep learning curve
  - Cadmium waste issue (193.4 ppm in waste stream). Cd is stored onsite for proper disposal

Field Test by USGS at Clear Creek, CO
6/22-6/25/01– Shows 24-hr nitrate changes



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Spring-Summer 2002

Calibration, Communication, and Transmission tests

Aided by Pete Rogerson and Charlie Patton

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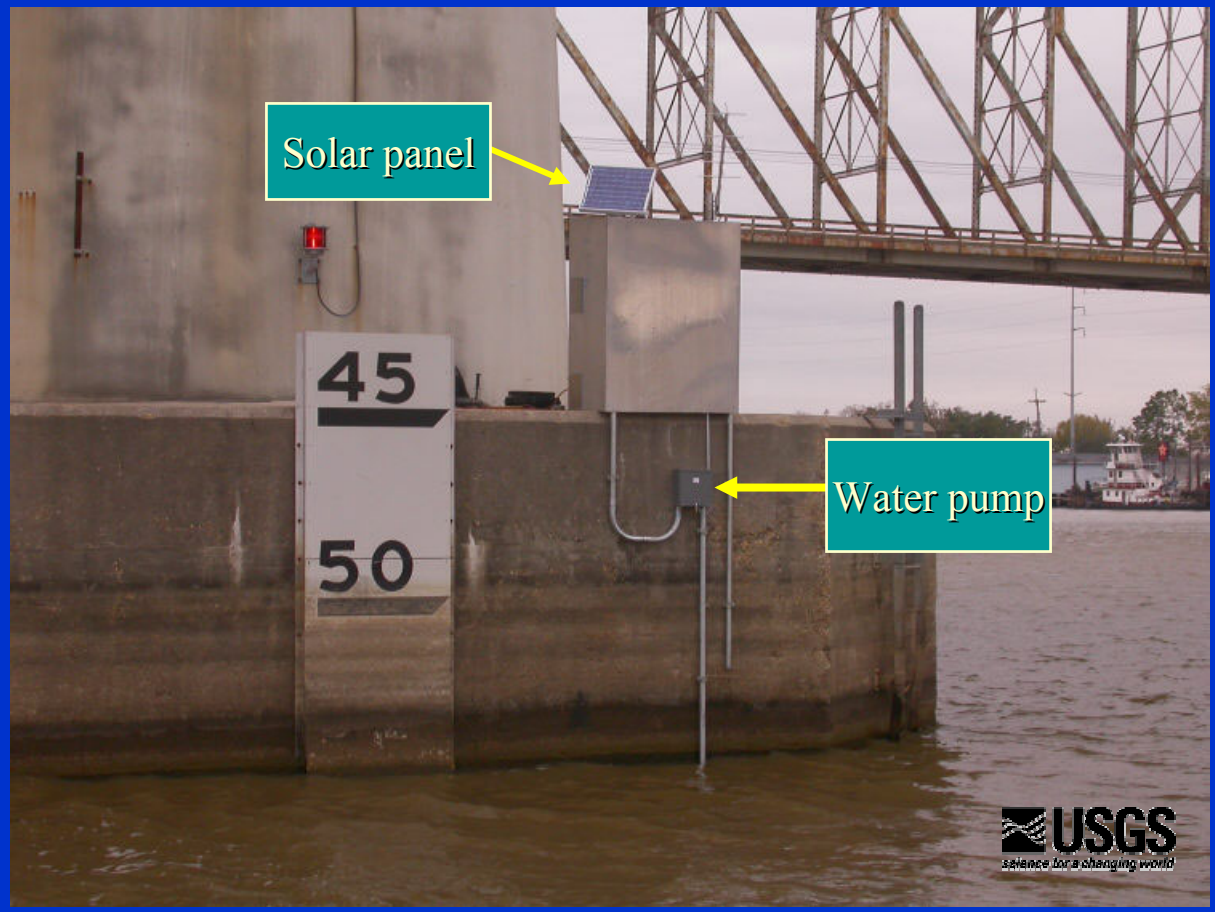
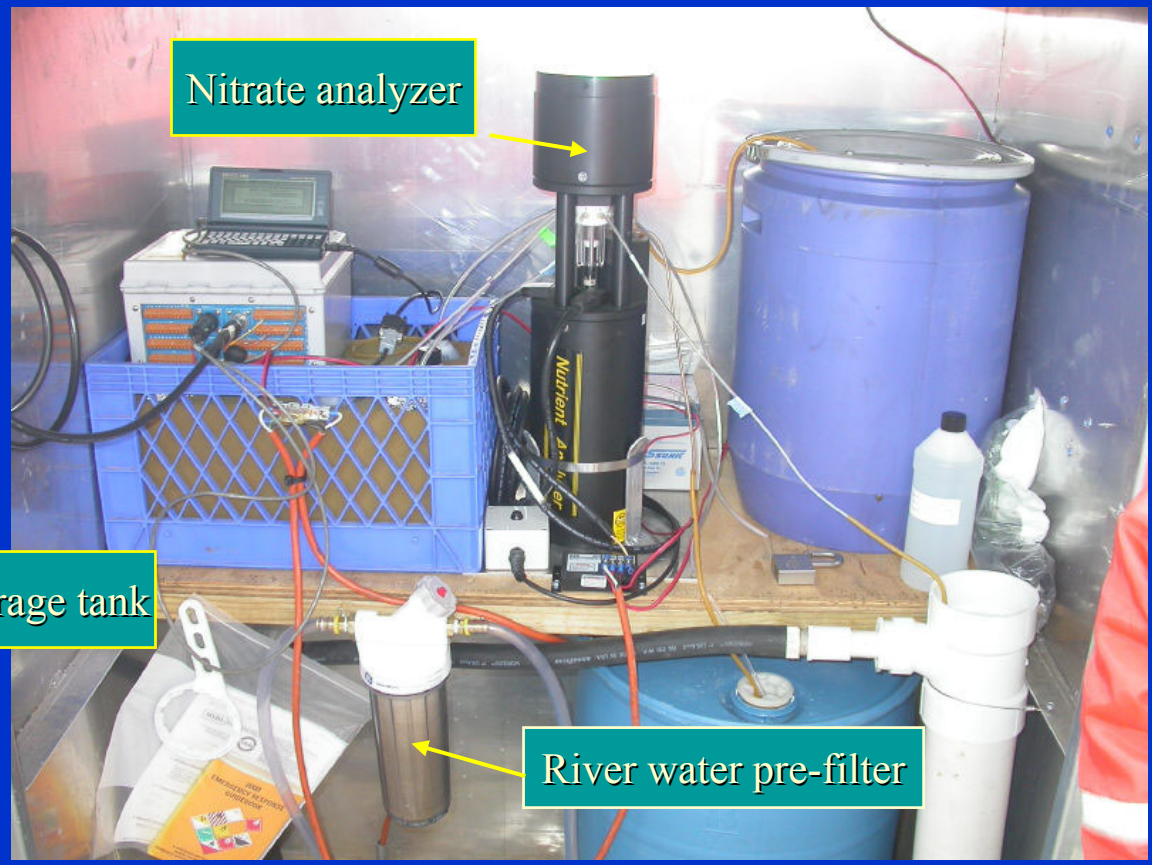
Lower Atchafalaya R. at Morgan City

Nitrate analyzer installation, 11/02

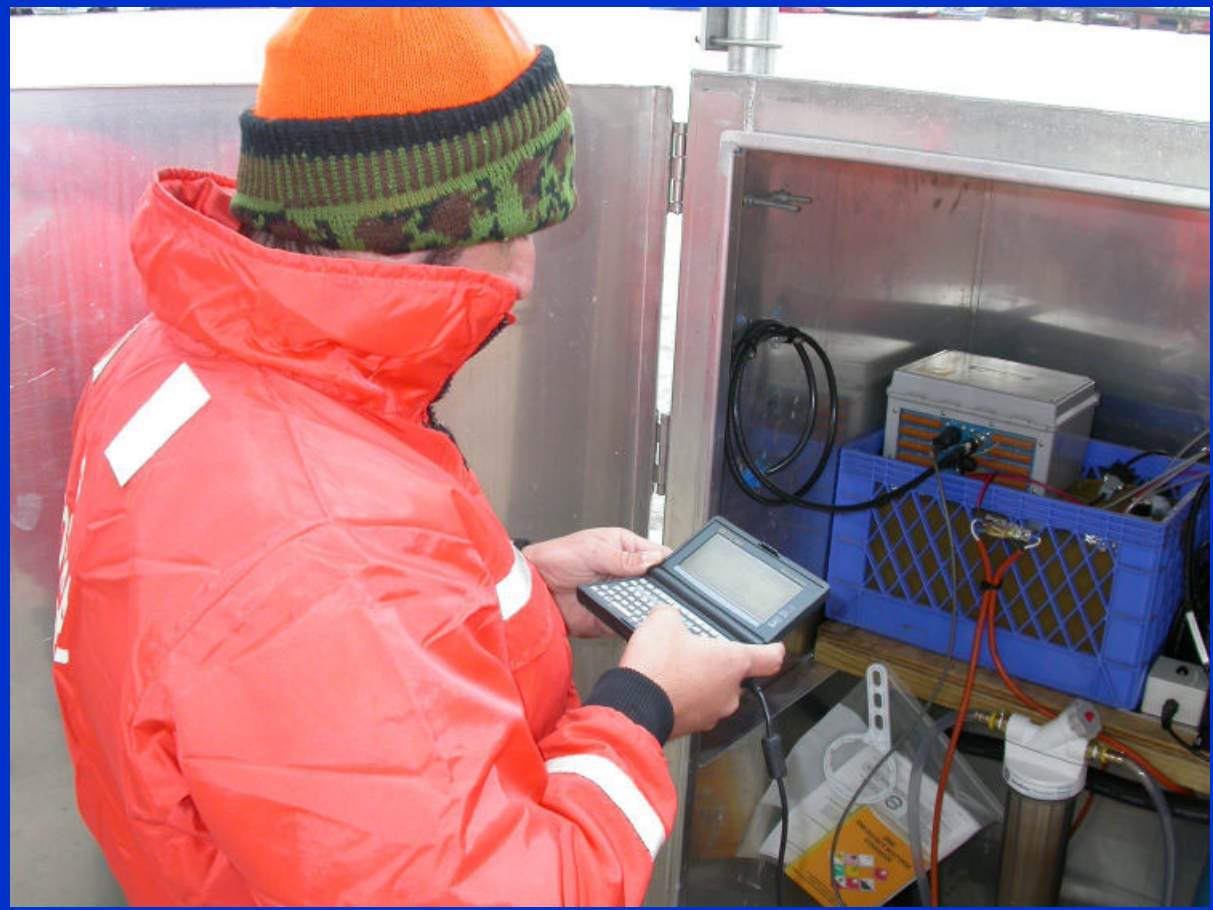


The NAS installed: Atchafalaya R. at Morgan City 11/02

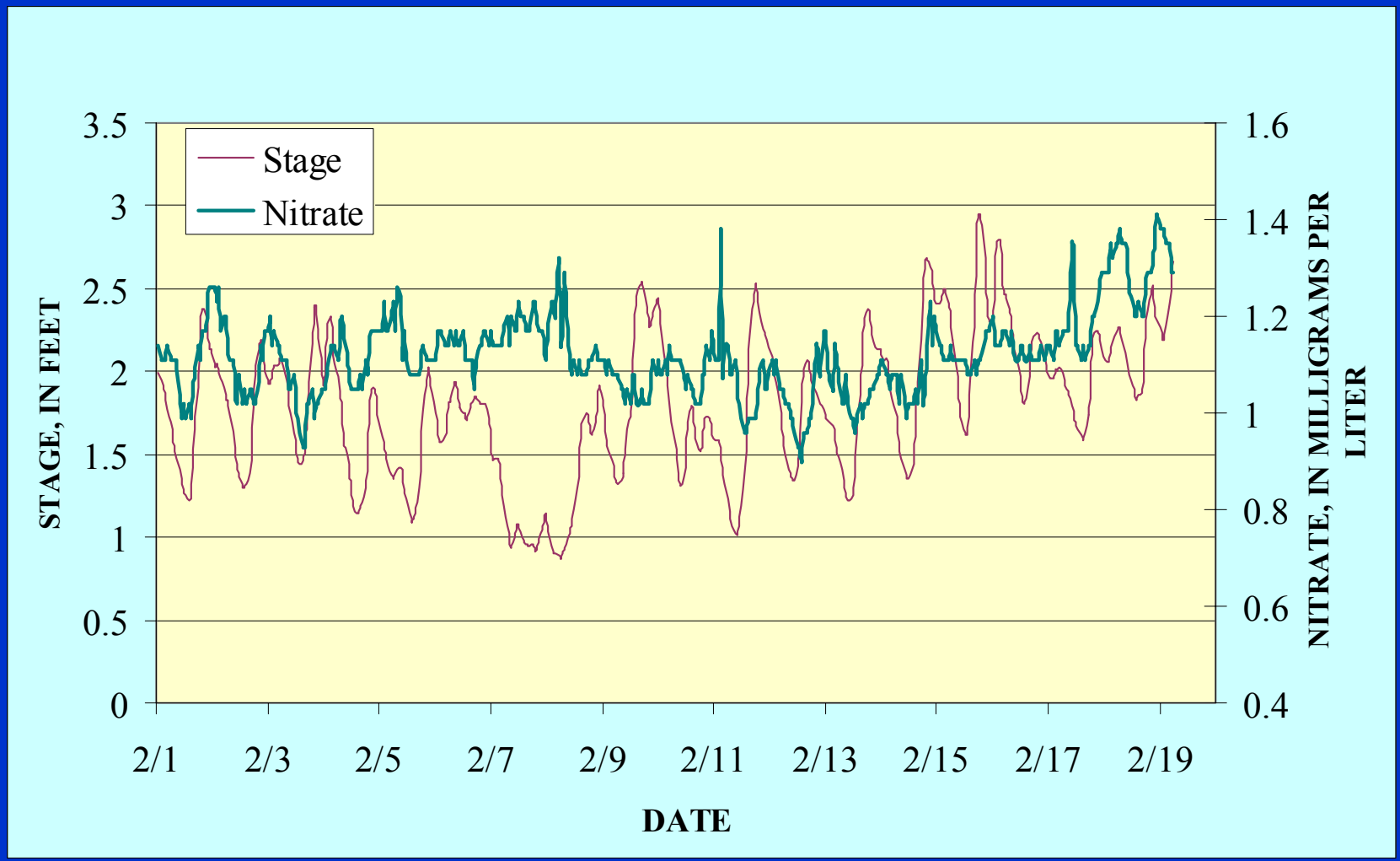


BR Field Office: Site visit by Kevin Labbe & Scott Perrien

Programming
Kevin Labbe'



Atchafalaya River at Morgan City, Feb. 2003: Nitrate & River Stage



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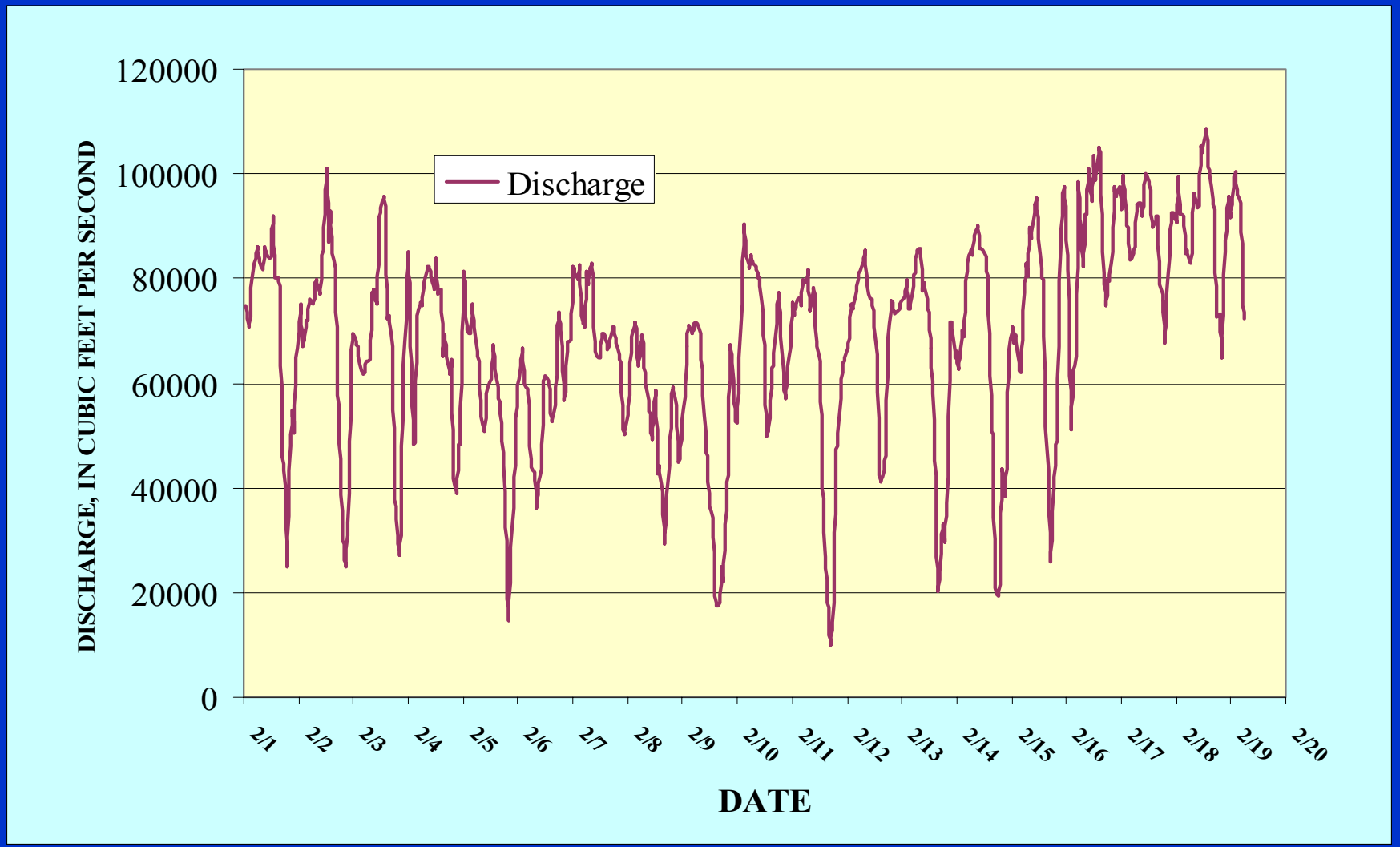
Atchafalaya River at Morgan City, Feb. 2003: Hourly Doppler Discharge



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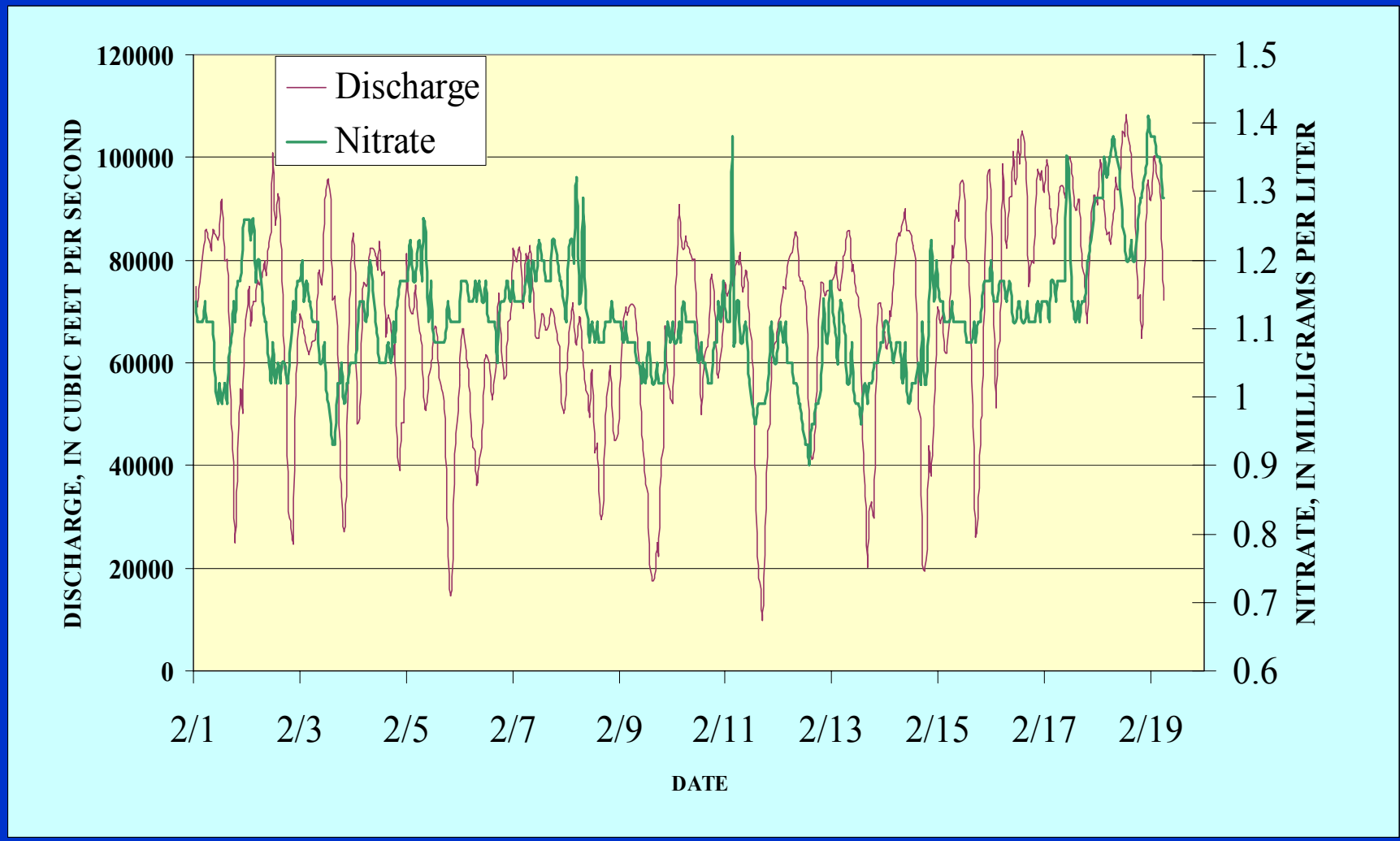
Atchafalaya River at Morgan City, Feb. 2003: Nitrate & Discharge



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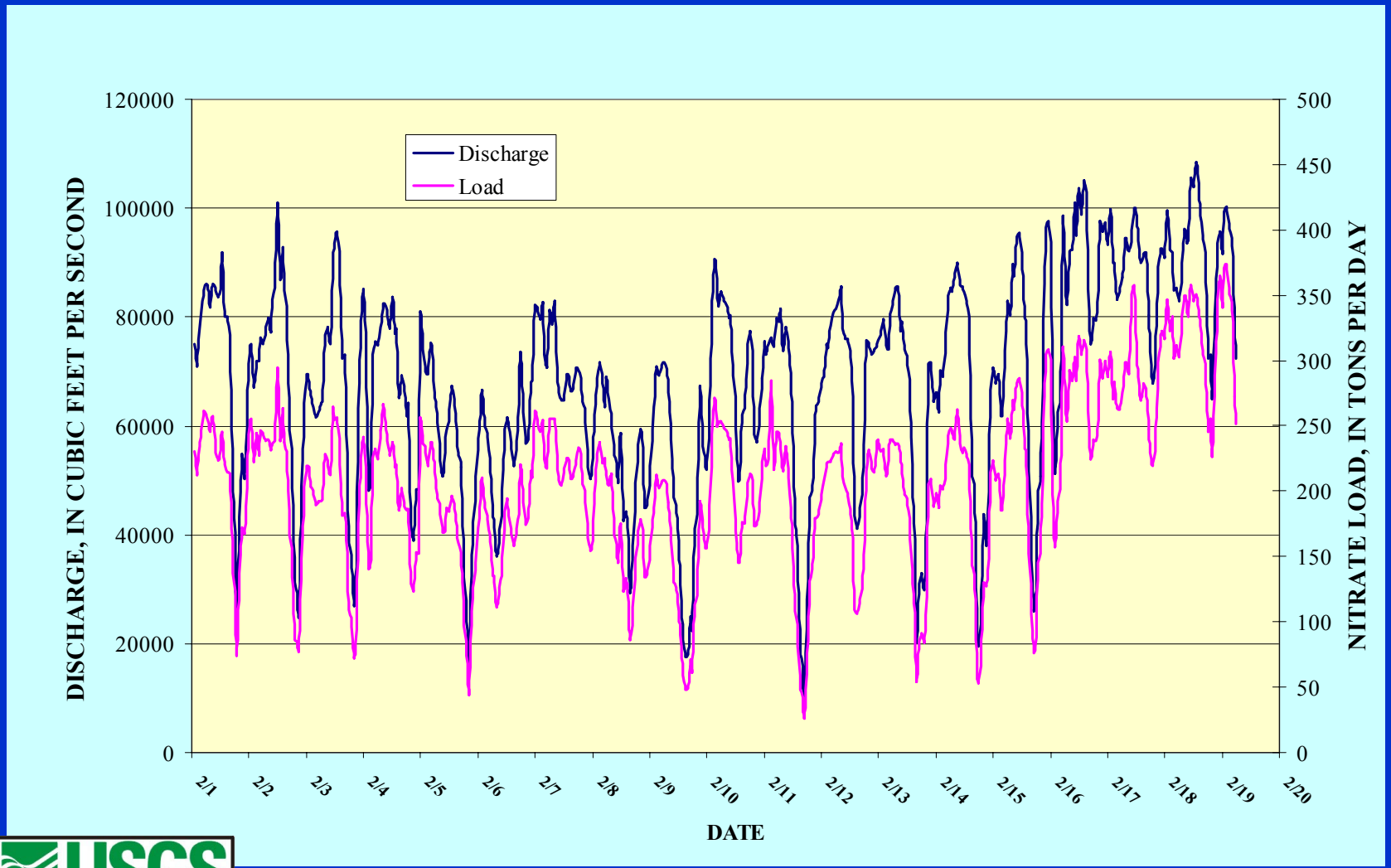
Atchafalaya River at Morgan City, Feb. 2003: Nitrate + Discharge = Loads



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Goals

- Wire the Mississippi-Atchafalaya system for real-time nitrate loads
- Predict the size of the hypoxic zone in the Gulf
- Assess the success of National efforts to reduce nutrient flux to the Gulf